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SHORT COMMUNICATION

Inconsistency of decision-making, the Achilles heel of referees

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ABSTRACT

AQ2 This study assessed whether decisions made by six qualified referees were consistent when watching the live 2016 televised Champions League Final. Referees were paired off into three separate rooms. Two referees watched the game with no supporters present. Two watched the game surrounded by Real Madrid supporters, and the remaining two watched the game surrounded by Athletic Madrid supporters. Referees were asked to decide whether each decision made by the on-field referee was either correct or incorrect. Results identified two types of refereeing inconsistency. The first type was a systematic tendency of the supporting crowds (both rooms) to influence the adjudicating referees to make fewer incorrect (disagree with the on-field referee) decisions (8 and 5) than referees in the "no supporters" room (19) ($\chi^2 = 11.22$ [df = 2], $P = 0.004$). The second type of inconsistency was the home advantage "bias", where the surrounding crowd influenced the adjudicating referees to favour their team, by disagreeing with the decision made by the on-field referee ($\chi^2 = 6.0$ [df = 2], $P = 0.0498$). One explanation for these inconsistencies is that referees adopt a coping strategy of "avoidance", i.e., when faced with difficult decisions, referees simply avoid making unpopular decisions by waving "play on".

ARTICLE HISTORY
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KEYWORDS
Coping strategy; avoidance; home advantage; referees' decision-making

Soccer referees are expected to make split second and accurate decisions, often under immense pressure, which can have far reaching effects (Lane, Nevill, Ahmad, & Balmer, 2006). Depending on the level of involvement, referees may be subject to performance evaluation by one of more of the following groups; players, spectators, peers and media (Weinberg & Richardson, 1990). As such, making errors (e.g., decisions and positioning in sports arena relative to play); making a controversial call; verbal abuse; crowd, coach and player pressure; criticism in the media; evaluation by a supervisor/assessor; and pressure games, have all been identified as stressors relative to decision-making when officiating (Balmer, Nevill, Lane, & Ward, 2007; Goldsmith & Williams, 1992).

Research suggests that home crowd noise may influence soccer official's decision-making to favour of the home side (Balmer, Nevill, Lane, & Ward, 2007; Goumas, 2014; Lane et al., 2006; Nevill, Balmer, & Williams, 2002). Such crowd noise is associated with increased anxiety and mental effort, with referees attempting to cope with this by providing decisions that favour the home team and are consequently more popular (Balmer, Nevill, Lane, & Ward, 2007). Better understanding refereeing decision-making with and without crowd noise could inform training and experiential learning with regards making decisions under pressure. This could help to ensure that rules are interpreted and applied in an equitable and fair manner; as referees can be supported in developing skills in managing stress and their own emotions (Cuskelly, Hoye, & Evans, 2004). Thus, the aim of the present study was to assess whether refereeing decisions can be effected by the presence or absence of a supporting crowd. The null hypothesis was that there would be no difference in the way referees responded to the on-field referee across the three rooms. The experimental hypothesis was that the presence of supporters would affect the decision-making of adjudicating referees, creating differences when compared to adjudications in the absence of supporters, thus increasing inconsistency in decision-making of the adjudicating referees.

Methods

Ethical approval for the present study was granted by the University of Wolverhampton ethics committee. Referees and supporters were recruited to the present study via the Spanish Football Association (RFEF – Royal Spanish Football Federation [Spanish: Real Federación Española de Fútbol]) in collaboration with the Spanish production company Twenty-four Seven. Working with RFEF and Twenty-four Seven not only facilitated recruitment but also overcame potential language barriers. As part of the recruitment process, referees and supporters were told they would be involved in an experiment, but not informed of the research objectives. Fans representing Real Madrid and Atletico Madrid were recruited via local supporter's groups in Madrid. RFEF were able to facilitate the recruitment of professional referees from all Spanish football divisions except the Primera División (La Liga, Spain's top division).

The six recruited referees provided by RFEF were professional referees from the Segunda División A (Second Division A), Segunda División B (Second Division B) and Tercera División

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(Third Division) of the Spanish football pyramid. Both fans and referees were paid a fee for their time. The six referees were invited to adjudicate the live televised football match (Champions League final 2016). Two of the referees watched and adjudicated the game with no supporters present (NO). Two of the referees watched the game surrounded by Real Madrid supporters (RM), and the remaining two referees watched the game surrounded by Athletic Madrid supporters (AM). There were 16 spectators present in both of the two supporter rooms, with the spectators situated 1 m behind the adjudicating referees. The home advantage was created in the rooms with the purposeful selection of engaged and enthusiastic supporters. The televised match was played at a volume such that a compelling atmosphere was created. Whilst not measured in decibels, the volume was set to the same level in all three rooms (including NO). Each referee was asked to simply decide whether each decision made by the on-field referee was correct (by pressing a green button which activated a green LED) or incorrect (by pressing a red button which activated a red LED), each decision to be made within two seconds of the on-field referee's decision. The decisions made by all six referees in the three rooms were recorded on videotape in real time (see Figure 1) and subsequently transcribed onto an excel spreadsheet for further analysis.

With regard to the televised game that referees adjudicated, after 90 min the score was 1–1, and so an additional 30 min of extra time (ET) was played. With no further score in ET, the game was followed by a penalty shoot-out which Real Madrid won 5–3.

Data analysis

Data were analysed to assess whether the decisions made by the adjudicating referees in the two rooms with supporters differed from decisions made by the adjudicating referees in the room without supporters. If differences were found, the data would then be analysed to see if decisions favoured the supported teams. At this stage, it was necessary to refer to the laws of the game as set out by the International Football Association Board (IFAB). This provided an objective means of evaluating decision-making in the context of the on-field incident, contrasting this against FIFA law. The laws set out by IFAB attempt to negate or limit referee bias – therefore providing the "correct" assessment of a foul. By referring to the laws and applying them to identified instances of disagreement, we could objectively evaluate the influence of supporters on decision-making.

The null hypothesis would be that no difference in decisions would be found and/or expected. The alternative hypothesis would be that the decisions made by the referees in the two rooms with supporters would affect the decision-making of the adjudicating referees differently to those when no supporters were present and favour the corresponding supported teams. Chi-square tests of independence were used to explore the presence of any inconsistencies in the adjudicating referees' decisions, first by room and second broken down by incidents.

Results

During the 120 min of open play (including injury time), the on-field referee made 58 decisions to penalise (or not to penalise) a competitive challenge. Table 1 (top section) describes the number of correct and incorrect decisions as judged by the six referees divided across the three rooms (NO, AM and RM).

The chi-square test of independence applied to these data in Table 1 (top section) was 12.67 (df = 5, $P = 0.027$). When the decisions made by the two paired referees in each room were combined, the chi-square test of independence was 11.22 (df = 2, $P = 0.004$; see Table 1, bottom section). The two referees adjudicating in the room with NO were significantly more likely to make a decision that the on-field referee was incorrect.

When each incident was examined separately (see Table 2), this tendency for the on-field referee to be judged incorrect

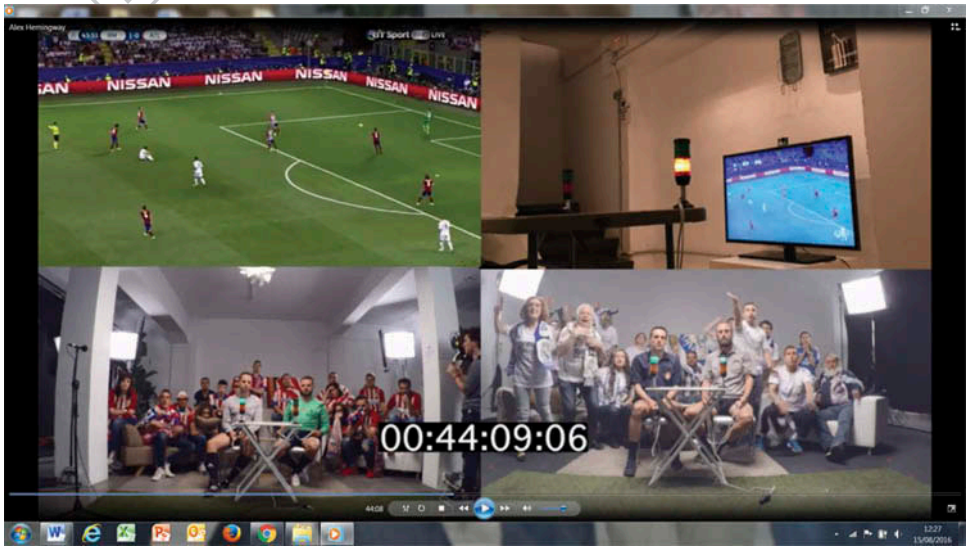

Figure 1. The televised match (top left), Athletico Madrid room (bottom left), Real Madrid room (bottom right) and room without supporters (top right).

Table 1. The number of on-field refereeing decisions deemed to be correct or incorrect as determined by the six adjudicating referees across the three rooms (NO, AM and RM).

	The six adjudicating referees separate						
	AM1	AM2	NO1	NO2	RM1	RM2	Total
Correct	55	53	47	50	55	56	316
Incorrect	3	5	11	8	3	2	32
Total	58	58	58	58	58	58	348
	Adjudicating referees combined in each room						
	AM		NO		RM		
Correct	108		97		111		316
Incorrect	8		19		5		32
Total	116		116		116		348

NO indicates the adjudicating referees who watched the game with no supporters present.
RM indicates the adjudicating referees who watched the game with Real Madrid supporters.
AM indicates the adjudicating referees who watched the game with Athletic Madrid supporters.

Table 2. The four key incidents where adjudicating referees were inconsistent.

		Referees			
Incident number and match time (min)		NO	RM	AM	Total
No 4	Correct	2	2	0	4
(4:59)	Incorrect	0	0	2	2
No 21	Correct	0	2	0	2
(44:09)	Incorrect	2	0	2	4
No 25	Correct	0	2	0	2
(50:32)	Incorrect	2	0	2	4
No 32	Correct	0	2	2	4
(61:39)	Incorrect	2	0	0	2

NO indicates the adjudicating referees who watched the game with no supporters present.
RM indicates the adjudicating referees who watched the game with Real Madrid supporters.
AM indicates the adjudicating referees who watched the game with Athletic Madrid supporters.

more frequently in the no supporters room was not consistent across the four key incidents/decisions (all four $\chi^2_1 = 6.0$ [df = 2], $P = 0.0498$).

In three of the four incidents, Athletico Madrid supporters appear to have influenced the adjudicating referees to favour Athletico Madrid (incidents 4, 21 and 25). The first adjudicator inconsistency (number 4) occurred 4.59 min into the match. Bale, playing for Real Madrid, had collected the ball in the opponent's half and made a direct run towards the goal. An Athletico Madrid defender impeded the progress of Bale, resulting in a foul being awarded by the referee to Real Madrid. According to the Football Association (FA) rules, "impeding the progress of an opponent means moving into the opponent's path to obstruct, block, slow down or force a change of direction when the ball is not within playing distance of either player" (IFAB Laws, 2016). Adjudicators in the presence of Real Madrid or in the absence of supporters all thought the referee made the correct decision. However, referee adjudicators in the presence of Athletico Madrid supporters disagreed with the referee's decision.

The second key incident occurred just before the first half ended at 44.09 min (see Figure 1). Gareth Bale misjudged his touch and kicked the ball too far ahead, and he then fell to the floor as contact was made with an Athletico Madrid defender. The referee decided there was no foul play, and continued to play on. In this instance, different to the aforementioned incident, Bale was not in control of the ball, and as such it may have been deduced that Bale looked for the foul rather than playing the ball. Although the Real Madrid fans were very animated, their reaction did not appear to influence the adjudicators as they both agreed that the referee made the correct decision. Conversely, the both Athletico Madrid and no supporters' adjudicators judged the referee to have made an incorrect decision.

A third key incident emerged at 50.32 min as an Athletico Madrid player grabbed a Real Madrid player's shirt and forced him to the ground. The referee awarded a foul against Athletico Madrid. The FA states "A direct free kick is awarded if a player holds another player and or pushes, trips or tackles a player in a manner considered by the referee to be careless, reckless or using excessive force" (IFAB, 2016). The Real Madrid fans were very animated following this challenge, and the Real Madrid adjudicators thought the referee made the right decision. However, Athletico Madrid adjudicators disagreed with the on-field referee as did the no supporters' adjudicators.

The final incident occurred at 61.39 min. A late challenge by Fernando Torres playing for Athletico Madrid was penalised by the referee, and a free kick awarded to Real Madrid. The offence seemed careless; defined by the FA as "when a player shows a lack of attention or consideration when making a challenge or acts without precaution" (IFAB, 2016). This rule also states no disciplinary sanction is needed. Torres received a yellow card following this challenge. The referee may have interpreted the challenge as reckless, defined as "when a player acts with disregard to the danger to, or consequences for, an opponent" (IFAB, 2016) in which case the law states that the player committing the reckless challenge must be cautioned. The subjective nature of this rule leaves it open to interpretation; therefore, this may partially explain the discordance amongst the adjudicators. The Real Madrid and Athletico Madrid adjudicators agreed with the referee's decision, even though the fans reacted in very different ways. The Real fans were making large gestures, whereas the Athletico fans were rather subdued. The no supporter adjudicators disagreed with the referee, even with a loud reaction from the stadium crowd that was audible on the video replay.

Discussion

The present case study identified two types of refereeing inconsistency. The first type of inconsistency was systematic, in that the four referees adjudicating in the two rooms with supporters were systematically *less* likely to question the decision made by the on-field referee compared with the two referees adjudicating without supporters (see Table 1, bottom section, $P = 0.004$). This suggests a tendency towards the use of avoidance as a coping strategy when faced with difficult decisions when surrounded by the ambient noise of a supporting/surrounding crowd, a tendency that has been observed in the previous research. When comparing decisions made by qualified referees under either silent or noise condition, Nevill et al. (2002, p. 261) reported that "those referees

viewing the challenges with background crowd noise were more uncertain in their decision making".

An absence of fans in the adjudicators room may have enabled them to consider situations more decisively and thoughtfully; basing decisions on their interpretation and implementation of IFAB rules without the influence of external parties. Crowd noise is associated with increased anxiety and cognitive load, with referees attempting to cope with this by providing more popular decisions that favour the home team (Balmer, Nevill, Lane, & Ward, 2007). The external cues presented by crowd noise may result in internal emotional cues, which may then alter the prioritization of attentional and working memory processes (Achtziger, Gollwitzer, & Sheeran, 2008). Because working memory has a limited capacity (Baddeley, 2001), rapid decision-making, which is reliant upon working memory, is likely to be impaired by the processing of crowd noise and resultant emotions using up valuable resources of working memory. Such a contention is consistent with the proposition that the conscious experience of emotion is represented in working memory (LeDoux, 1998).

A second type of inconsistency can be described as the "home advantage bias", as illustrated in the four key incidents reported in Table 2. In particular, in three of the four incidents, Athletico Madrid supporters appear to have influenced the adjudicating referees to favour Athletico Madrid (incidents 4, 21 and 25). This is also supported by the work of Nevill et al. (2002, p. 261), who reported that "those referees viewing the challenges with background crowd noise awarded significantly fewer fouls (15.5%) against the home team, compared with those watching in silence". This is precisely what the Athletico Madrid supporters appear to have achieved. In the first three of the four incidents, the presence of the Athletico Madrid supporters appeared to encourage the adjudicating referees to disagree with the on-field referee, who had either penalised an Athletico Madrid player (incidents 4 and 25) or failed to penalise a Real Madrid player (incident 21). Surprisingly, RM failed to encourage the adjudicating referees to disagree with any of the on-field referee's decisions in a way that would favour Real Madrid players.

The potential for interventions that seek to minimise both forms of refereeing inconsistency may be found in the sport coping literature. Research indicates that referee's show a strong preference towards ignoring or discounting the taunts and other verbal criticisms from spectators (Anshel & Weinberg, 1996; Kaissidis & Anshel, 1993; Kaissidis-Rodafinos, Anshel, & Porter, 1997).

It has been argued that referees who can ignore spectator noise may feel less stressed, and continue to attend to relevant cues more effectively than referees who feel compelled to react to, and be distracted by such noise (Kaissidis-Rodafinos et al., 1997; Louvet, Gaudreau, Menaut, Genty, & Deneuve, 2009). From a working memory perspective, an ability to be free of the influence of spectator noise would preserve capacity for decision-making. Whilst it is not possible to "un-hear" crowd noise, and thus completely ignore it, it is possible to be mindful of crowd noise, without influence. Being mindful involves a non-judgemental awareness of being in the moment, acknowledging moment-by-moment experiences (Kabat-Zinn, 2004). Being mindful is a coping strategy that might better equip referees to acknowledge spectator noise momentarily, with the key emphasis being "without judgement", before then interpreting and applying FA rules as appropriate to the situation and context.

There are acknowledged limitations with the present study. We did not explore the process of decision-making, and factors of perceived influence with the adjudicator referees. Interviews may have helped ascertain how adjudicating referees came to a decision, and if there were factors that influenced decision-making (e.g., spectator noise audible from the broadcasting of the match, or the noise and actions of supporters present in the room). Although the number of supporters who were present in the rooms, and television broadcasting volume was controlled, the measuring noise levels in each of the three experimental rooms would have allowed further exploration of factors of plausible influence. We recommend that future research measures the time taken for adjudicator to make decisions allowing a more in depth examination of decision-making.

In summary, the case study has identified two types of refereeing inconsistency. The first type appears to be a consistent, systematic tendency of the surrounding crowd (supporters of both teams) to influence the adjudicating referees to make fewer decisions, possibly caused by the distracting effect of the crowd, leading to the adjudicating referees to become more uncertain about their decision-making (see Nevill et al., 2002, p. 261). The second type of inconsistency is the well-known "home advantage" bias, where the surrounding crowd appears to influence the adjudication referees to favour (albeit subconsciously) the team they are supporting. This study highlights a need to research the potential utility of coping strategies such as mindfulness that appropriately minimise stress and optimise concentration and performance, outcomes that should intuitively enhance the consistency of decision-making.

Disclosure statement

No potential conflict of interest was reported by the authors.

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